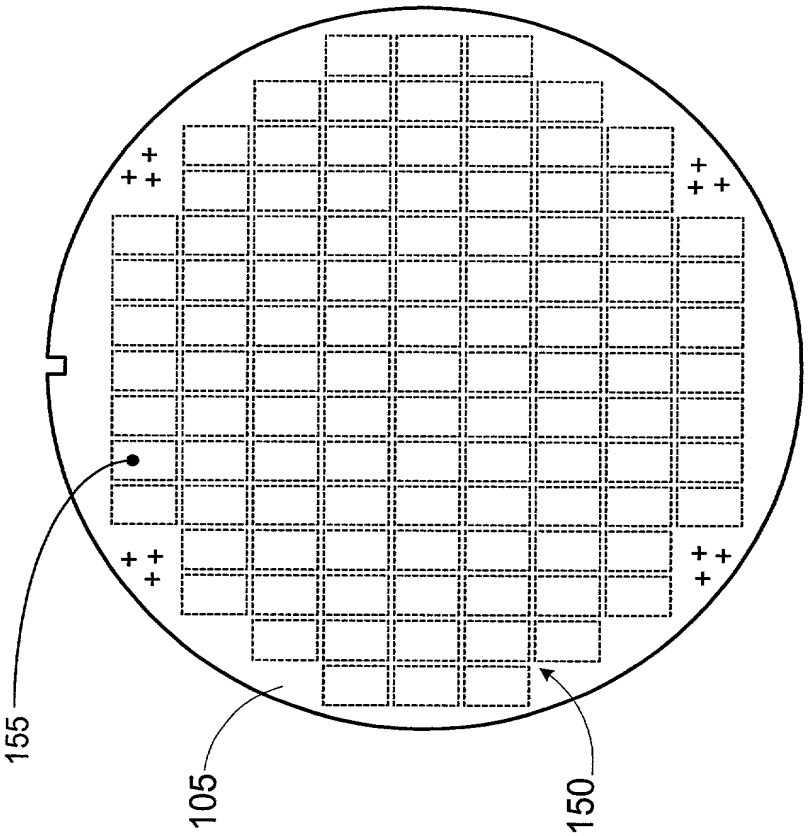

FIGURE 1 (Prior Art)

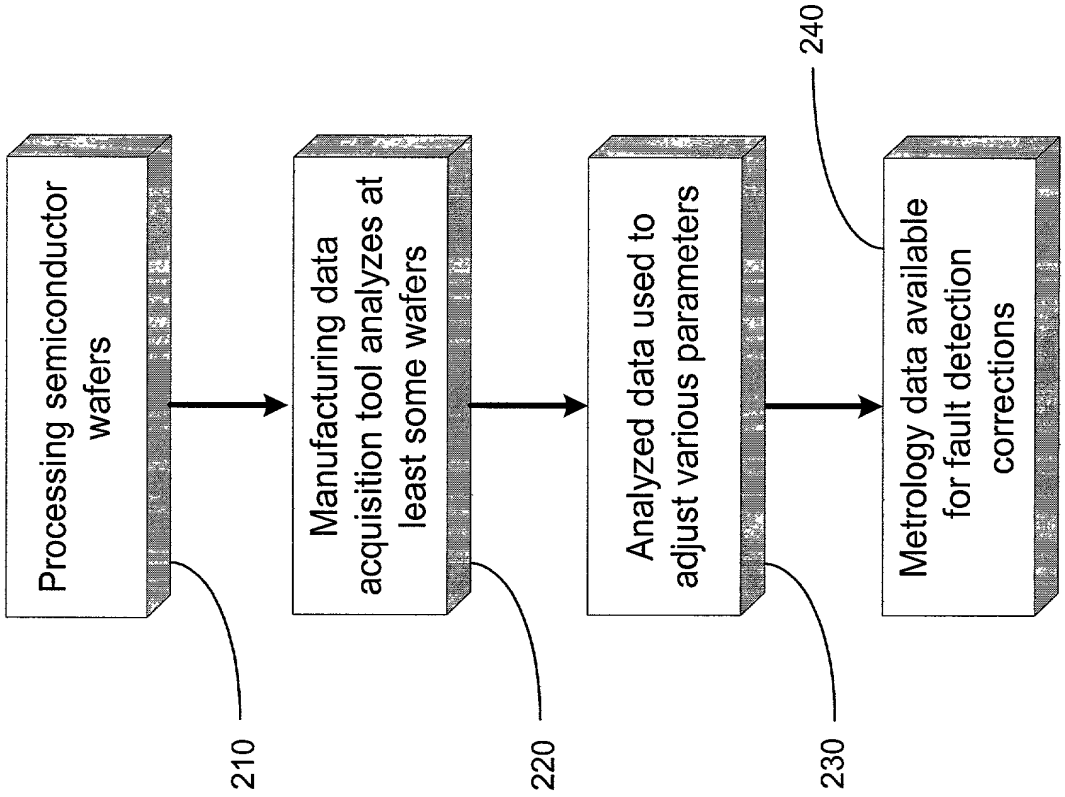

FIGURE 2 (Prior Art)

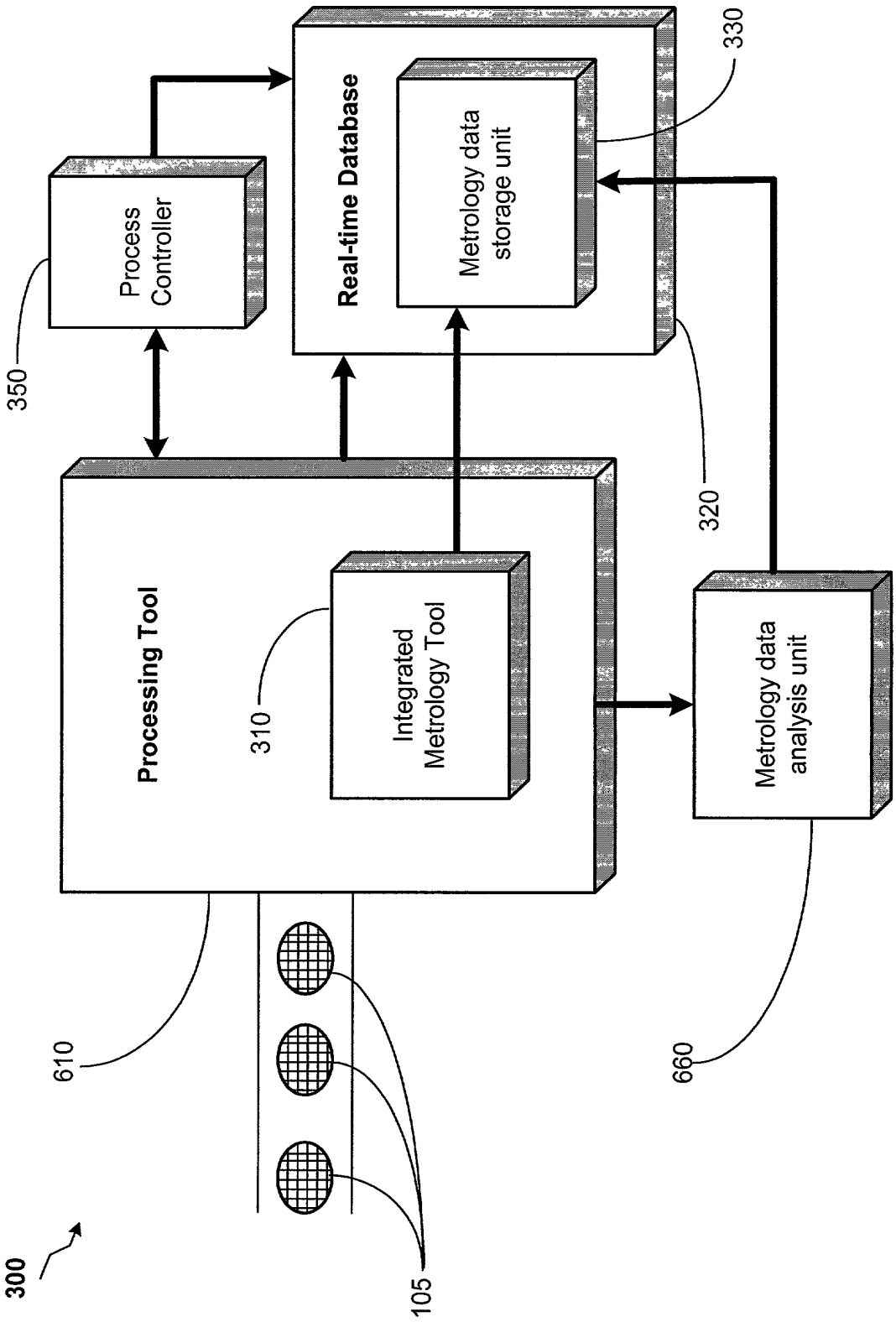
300
105
610
660
Processing Tool
310
Integrated Metrology Tool
320
Real-time Database
330
Metrology data storage unit
350
Process Controller
Metrology data analysis unit

FIGURE 3

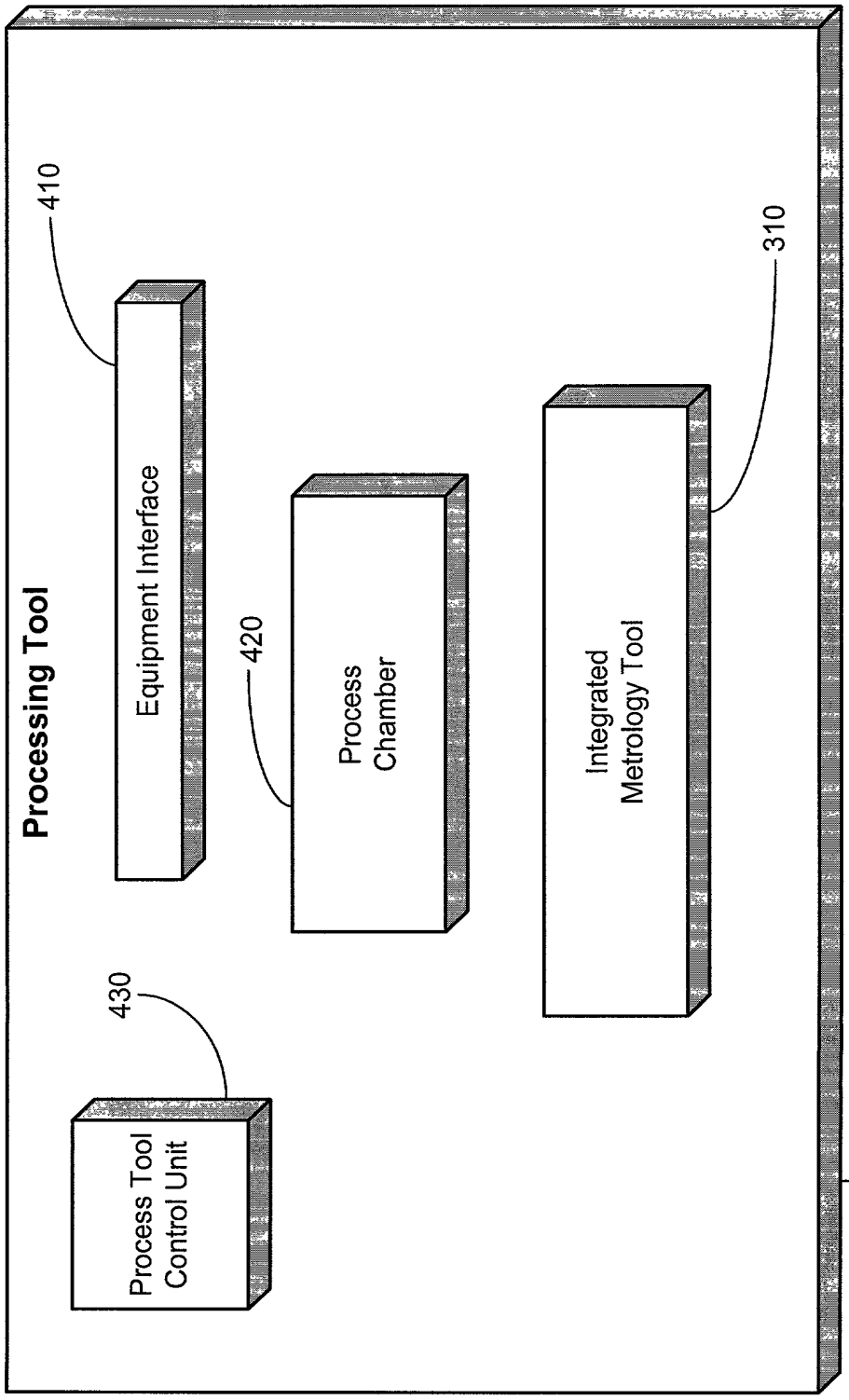
Processing Tool
410
Equipment Interface
420
Process Chamber
310
Integrated Metrology Tool
430
Process Tool Control Unit
610

FIGURE 4

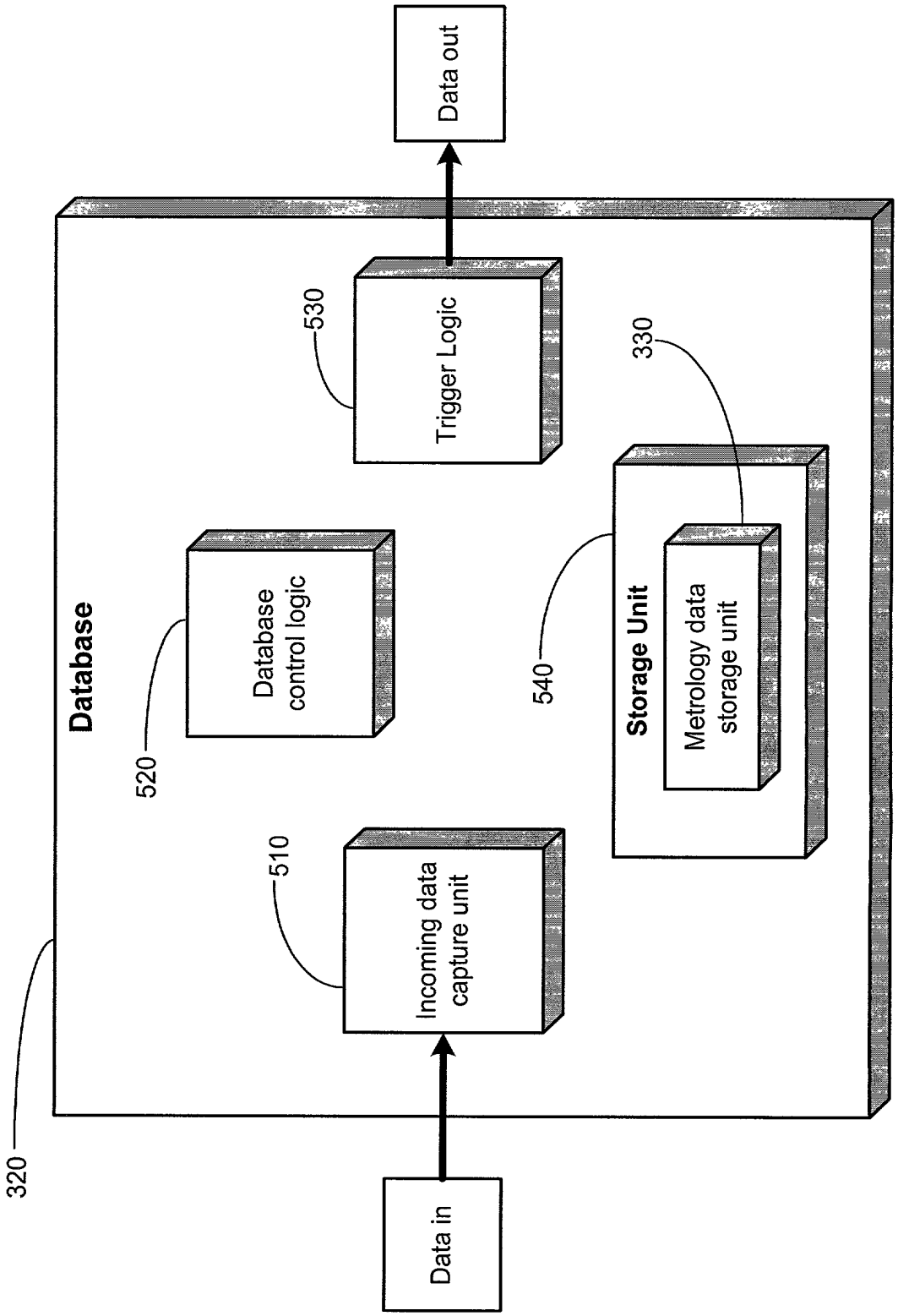
Data out
Trigger Logic
530
330
Database
Database control logic
520
Storage Unit
Metrology data storage unit
540
510
Incoming data capture unit
320
Data in

FIGURE 5

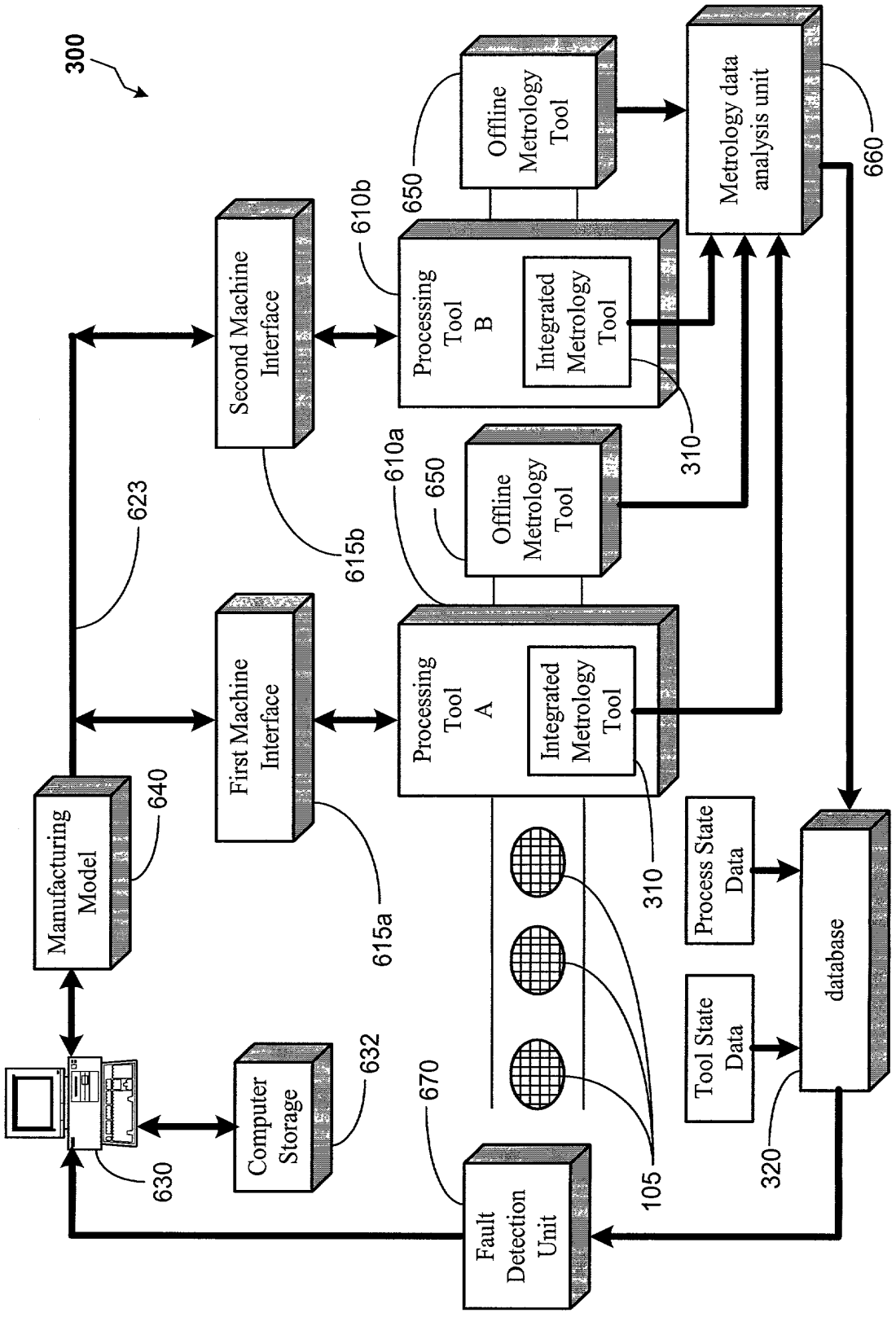
300
Offline Metrology Tool
650
Metrology data analysis unit
660
610b
Second Machine Interface
Processing Tool B
Integrated Metrology Tool
310
623
610a
650
Offline Metrology Tool
615b
First Machine Interface
Processing Tool A
Integrated Metrology Tool
310
Manufacturing Model
640
615a
Process State Data
database
Tool State Data
320
105
670
Fault Detection Unit
Computer Storage
632
630

FIGURE 6

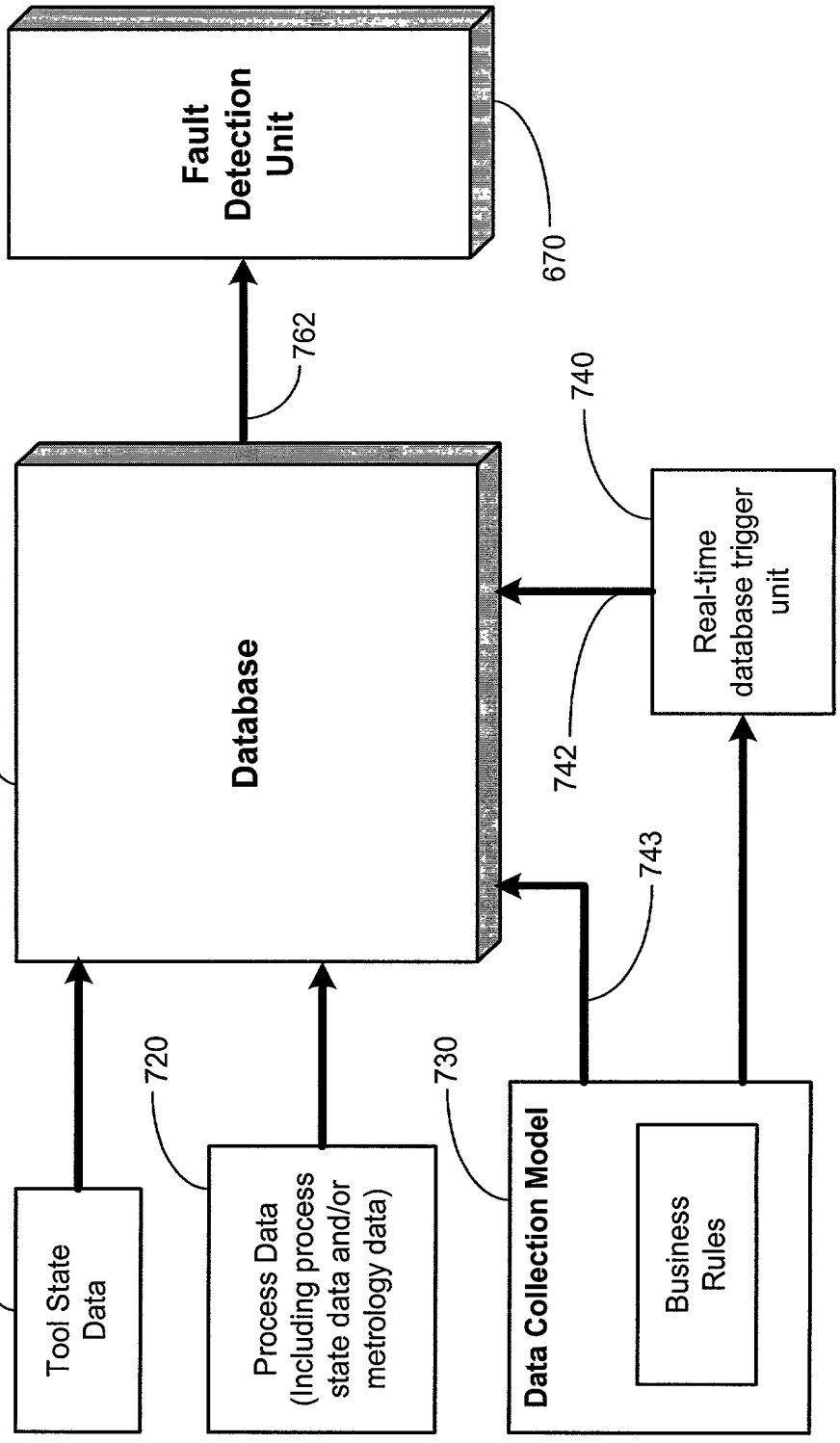
Fault Detection Unit
670
762
740
Database
320
Real-time database trigger unit
742
743
710
720
730
Tool State Data
Process Data (Including process state data and/or metrology data)
Data Collection Model
Business Rules

FIGURE 7

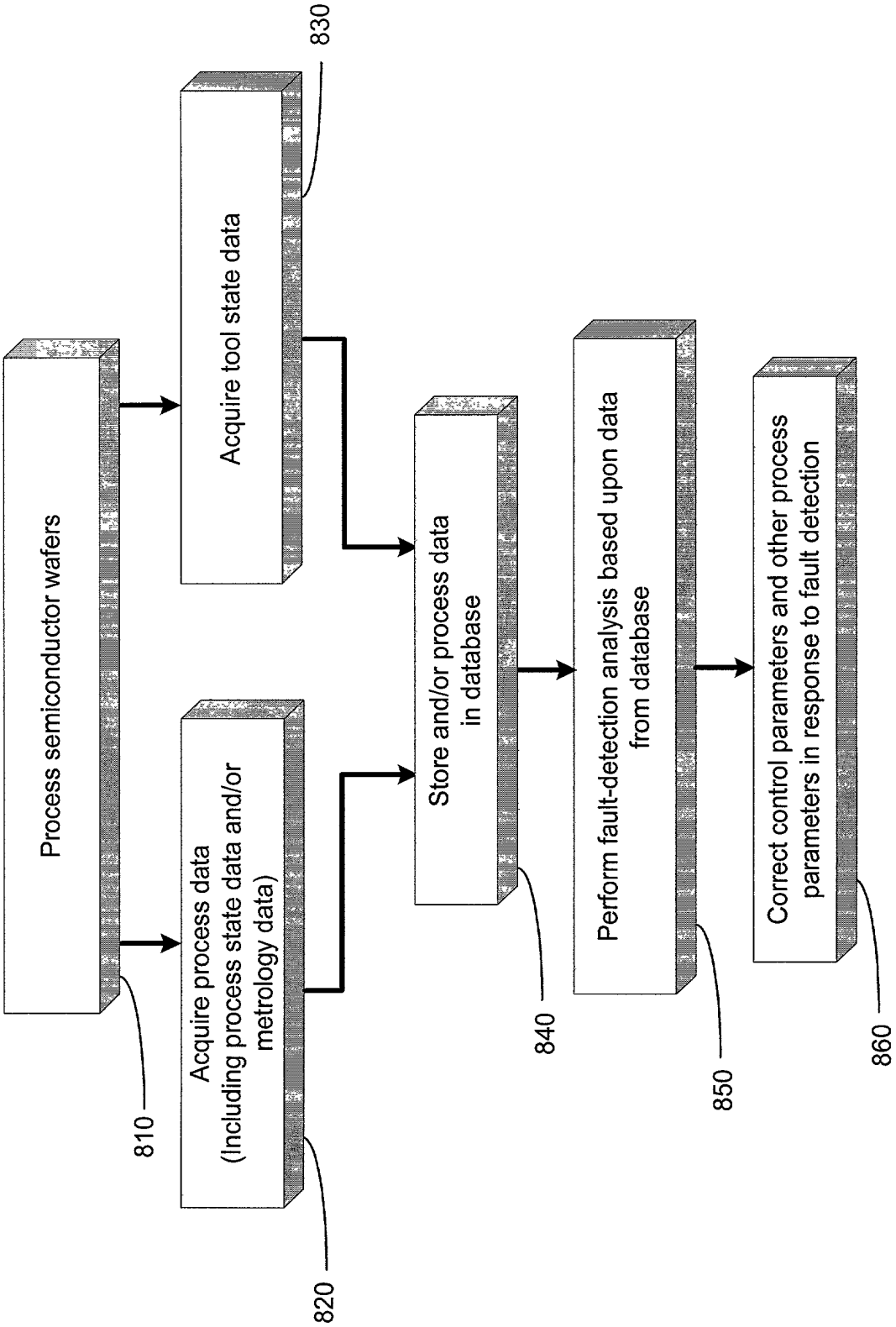
Process semiconductor wafers
Acquire process data (Including process state data and/or metrology data)
Acquire tool state data
Store and/or process data in database
Perform fault-detection analysis based upon data from database
Correct control parameters and other process parameters in response to fault detection
810
820
830
840
850
860

FIGURE 8

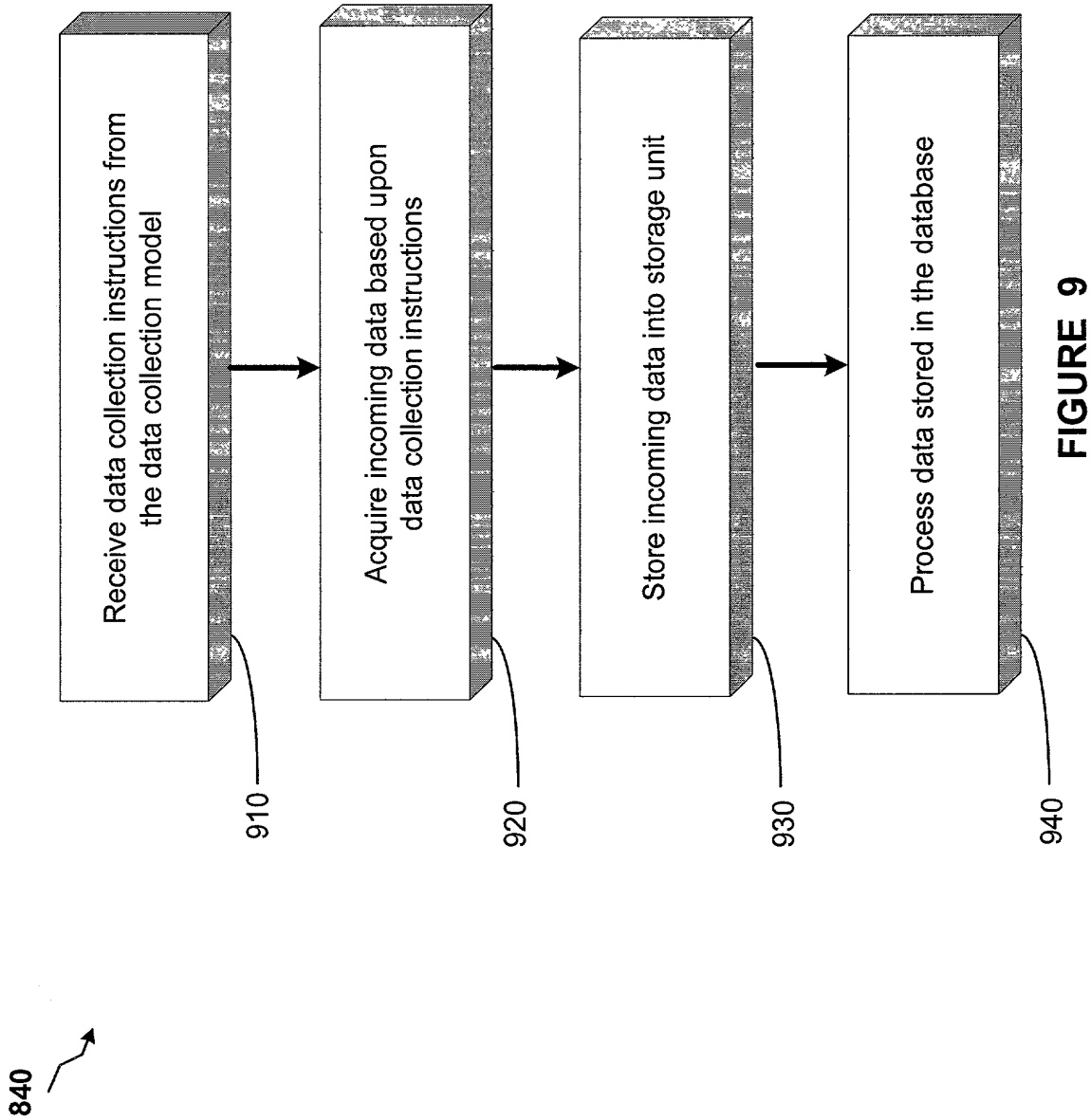
840
Receive data collection instructions from the data collection model
910
Acquire incoming data based upon data collection instructions
920
Store incoming data into storage unit
930
Process data stored in the database
940

FIGURE 9

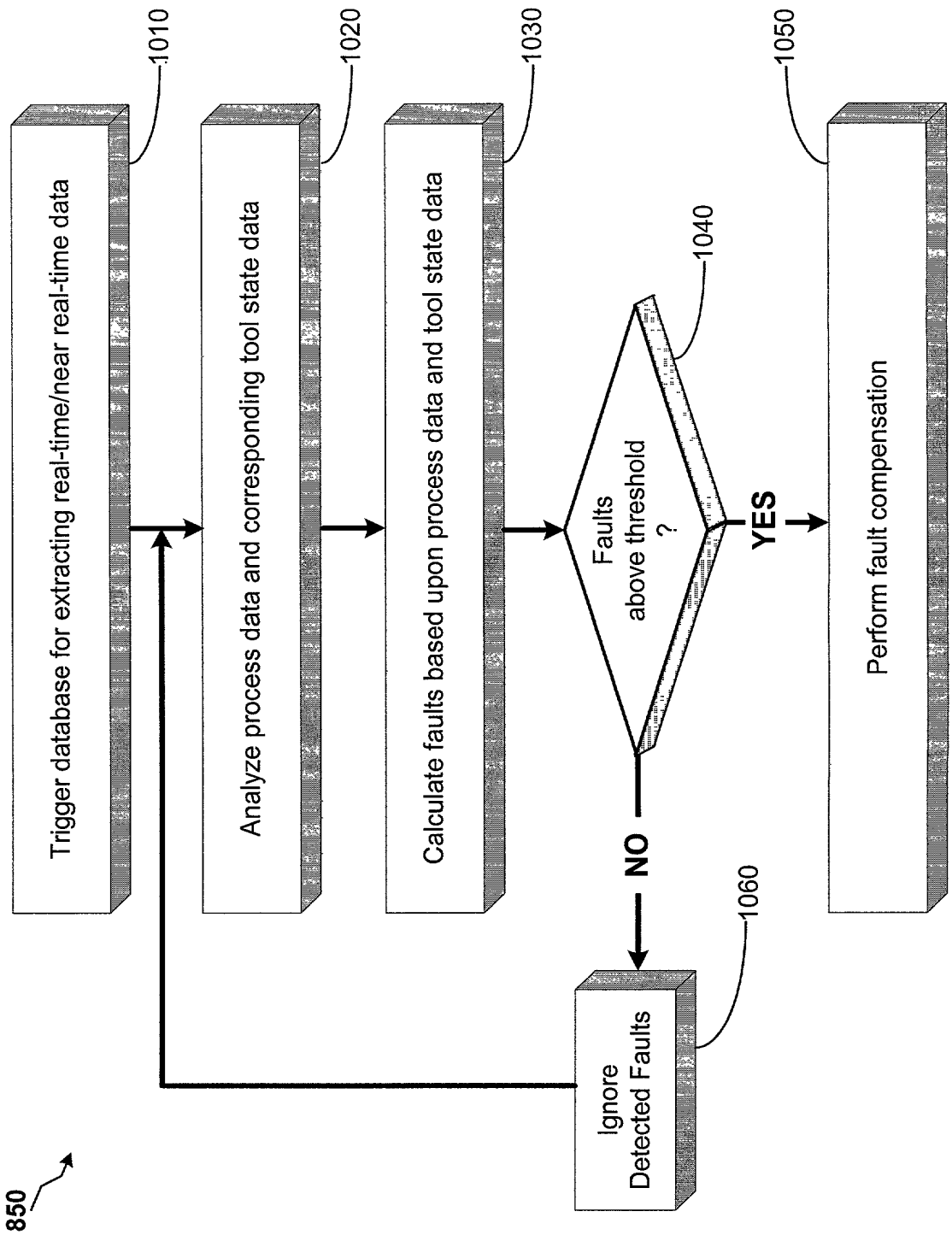
850
Trigger database for extracting real-time/near real-time data
1010
Analyze process data and corresponding tool state data
1020
Calculate faults based upon process data and tool state data
1030
Faults above threshold ?
1040
YES
NO
Perform fault compensation
1050
Ignore Detected Faults
1060

FIGURE 10